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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,322	02/26/2004	Shoichi Ando	12052.33USD1	9419
7590 04/16/2008 Hamre, Schumann, Mueller & Larson, P.C. P.O. Box 2902-0902 Minneapolis, MN 55402				
EXAMINER				
ZHU, WEIPING				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/789,322

Applicant(s)

ANDO ET AL.

Examiner

WEIPING ZHU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-19, 21 and 22 is/are pending in the application.
4a) Of the above claim(s) 10-17, 21 and 22 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1, 3-9, 18 and 19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 26, 2008 has been entered.

Status of Claims

2. Claims 1, 3-9, 18 and 19 are currently under examination wherein claims 1, 5, 9, 18 and 19 have been amended in applicant's amendment filed on February 26, 2008. The previously presented claims 20 and 23 have been cancelled in the same amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61-129246 in view of Tomioka et al. (US 3,532,560).

With respect to claim 1, JP ('246) discloses a method for manufacturing a billet for cold forging comprising: annealing a blank of medium carbon steel, drawing the

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blank, annealing the drawn blank to form a billet; and cutting the billet (2nd paragraph, right column, page 4, Fig. 2, orally translated by an USPTO translator).

JP ('246) does not specify the first and second annealings as spheroidizing annealings as claimed. However, it would have been obvious to one of ordinary skill in the art that the annealings are functionally equivalent to the spheroidizing annealings in terms of reducing the hardness of such a steel to a level suitable for the cold shaping operation as evidenced by Tomioka et al. ('560) (col. 2, lines 5-10). The substitution of the annealings in JP ('246) by the functionally equivalent spheroidizing annealings would lead to the expected success. See MPEP 2144.06.

JP ('246) does not disclose the drawing ratio as claimed. Tomioka et al. ('560) discloses that the drawing ratio of a medium carbon steel wire is less than 20% (col. 3, lines 45-56 and col. 7, lines 62-65). The claimed ratio of "approximately 20%" includes the less than 20% as disclosed by Tomioka et al. ('560). It would have been obvious to one of ordinary skill in the art to have applied a drawing ratio of less than 20% as disclosed by Tomioka et al. ('560) in the process of JP ('246) in order to achieve the desired diameter and tensile strength of the wire as disclosed by Tomioka et al. ('560) (col. 7, lines 62-65).

JP ('246) in view of Tomioka et al. ('560) does not specify the microstructure features as claimed. However, it has been well held where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195

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USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I. In the instant case, the claimed and JP ('246) in view of Tomioka et al. ('560)'s blanks are identical or substantially identical in structure or composition and are produced by identical or substantially identical processes, therefore a prima facie case of obviousness exists. The same microstructure features would be expected in the blank of JP ('246) in view of Tomioka et al. ('560) as in the claimed blank.

With respect to claim 3, the cutting step disclosed by JP ('246) is after the 2nd annealing. However it is well held that in general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and results, was held to be not patentably distinguish the processes. *Ex parte Rubin* 128 USPQ 159 (PO BdPatApp 1959).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('246) in view of Tomioka et al. ('560) as applied to claim 1 above and further in view of JP 07-097656.

JP ('246) in view of Tomioka et al. ('560) does not specify the chemical composition of the medium carbon steel as in the instant claim 4.

JP ('656) discloses a cold forging medium carbon steel with a chemical composition comprising: C: 0.3-0.6 wt.%; Si: 0.10 wt.% or less; Mn: 0.15-0.65 wt.%; P: 0.10 wt.% or less; S: 0.10 wt.% or less; Cu: 0.05-0.40 wt.%; Ni: 0.05-0.40 wt.%; and Cr: 0.50 wt.% (abstract and claim 2, translation), which overlaps the claimed composition. A prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to substitute the medium carbon steel of JP

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('246) with that of JP ('656) in the process of JP ('246) with expected success because both medium carbon steels would have similar compositions.

5. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. (US 4,704,166).

With respect to claim 5, the teachings of JP ('246) in view of Tomioka et al. ('560) regarding the method for manufacturing a billet for cold forging and the annealing to reduce the hardness of a medium carbon steel to a level suitable for the cold shaping operation as discussed in the paragraph above are applied to meet the respective claim limitations.

JP ('246) in view of Tomioka et al. ('560) does not teach quenching a blank unloaded from a heating furnace to form a fine martensite in a surface as claimed.

Bach et al. ('166) disclose a method for producing a medium carbon steel rod comprising cooling the hot-rolled article quickly to form a surface layer of martensite (col. 1, line 62 – col. 2, line 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare the blank of JP ('246) in view of Tomioka et al. ('560) by quenching the blank to form a surface layer of martensite as disclosed by Bach et al. ('166) in order to reduce the cooling line length as disclosed by Bach et al. ('166) (col. 2, lines 30-32).

JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) does not specify the microstructure features after the quenching and annealing steps as

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claimed. The ground of rejection of the microstructure limitations of the instant claim 1 as discussed in the paragraph above is further applied properly herein.

With respect to claim 9, JP ('246) discloses cold forging the billet by continuously drawing the billet, extruding the billet, upsetting the billet and finishing the billet without softening the billet in an intermediate stage (2nd paragraph, right column, page 4, Fig. 1, orally translated by an USPTO translator).

6. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) as applied to the claim 5 above and further in view of JP ('656).

With respect to claims 6 and 7, JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) does not disclose the annealing schedules as claimed. JP ('656) discloses that a blank is annealed by holding the blank at 730°C for 4 hours, thereafter dropping the temperature to 680°C at a rate of 10°C/hour and thereafter cooling the blank in a furnace (paragraph [0018], translation). The disclosed annealing process is substantially identical to the annealing process claimed in the instant claim 6.

JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) and JP ('656) does not teach the annealing schedule in the instant claim 7. However, it is well held that discovering an optimum value of a result-effective variable involve only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, the annealing parameters are result-effective variables, because they would directly affect the spheroidized structure of the blank as disclosed by JP ('656)

(right col., Line 5, page 78 to left col., line 2, page 80). See MPEP 2144.05 II. Therefore, it would have been obvious to one of ordinary skill in the art to have optimized the annealing parameters in the process of JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) and JP ('656) for the desired spheroidized structure of the blank. See MPEP 2144.05 II.

With respect to claim 8, JP ('656) is applied to the claimed composition for the same reason as stated in the paragraph 4 above.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('246) in view of JP ('656) and further in view of Sakai et al. (US 5,878,323)

With respect to claim 18, JP ('246) discloses a method for cold forging a billet comprising continuously cold forming the billet into a desired shape (2nd paragraph, right column, page 4, Fig. 1, orally translated by an USPTO translator).

JP ('246) does not specify the billet is formed into a crankshaft as in the instant claims 18 and 20. However it is well settled that merely changing the size of an article is not a matter of invention. See MPEP 2144.04 IV.

JP ('246) does not specify the chemical composition of the medium carbon steel as in the instant claim 18. JP ('656) is applied to the claimed composition for the same reason as stated in the paragraph 4 above.

JP ('246) in view of JP ('656) does not specify the aging step as claimed in the instant claim 18.

Sakai et al. ('323) discloses aging a plastically worked connecting rod or bearing (col. 5, lines 40-45) at 240° C for 3 hours followed by cooling it down to normal

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temperature (col. 13, lines 34-46). The aging temperature and time of Sakai et al. ('323) are close to the claimed lowest temperature and longest time respectively. A prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an aging step after the cold forming step in the process of JP ('246) in view of JP ('656) as disclosed by Sakai et al. ('323) in order to enhance the nature of the alloy (e.g. strength, hardness, toughness and internal stress level etc.) as disclosed by Sakai et al. ('323) (col. 5, lines 40-45).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('246) in view of Tomioka et al. ('560) and further in view of JP ('656) and Sakai et al. ('323)

With respect to claim 19, JP ('246) in view of Tomioka et al. ('560) is applied to the claim for the same reason as stated in the paragraph 3 above. JP ('246) in view of Tomioka et al. ('560) discloses a method for manufacturing a billet for cold forging comprising first spheroidizing annealing a blank, drawing the blank and the second spheroidizing annealing the drawn blank to form a billet as claimed.

With respect to claim 19, JP ('246) further discloses a method for cold forging a billet comprising continuously cold forming the billet into a desired shape (2nd paragraph, right column, page 4, Fig. 1, orally translated by an USPTO translator)..

JP ('246) in view of Tomioka et al. ('560) does not specify the billet is formed into a crankshaft as in the instant claims 19 and 23. However it is well settled that merely changing the size of an article is not a matter of invention. See MPEP 2144.04 IV.

JP ('246) in view of Tomioka et al. ('560) does not specify the chemical composition of the medium carbon steel as in the instant claim 19. JP ('656) is applied to the claimed composition for the same reason as stated in the paragraph 4 above.

JP ('246) in view of Tomioka et al. ('560) and further in view of JP ('656) does not specify the aging step as in the instant claim 19. Sakai et al. ('323) is applied to the claimed aging step for the same reason as stated in the paragraph 7 above.

Response to Arguments

9. The applicant's arguments filed on February 26, 2008 have been fully considered but they are not persuasive.

First, the applicant argues that JP ('246) does not disclose the microstructure features after the first spheroidizing annealing as claimed in the instant claim 1. In response, see the reason for the rejection of claimed features in the paragraph 3 above.

Second, the applicant argues that Tomioka et al. ('560) teaches a drawing step applicable to a different structure and for a different purpose than as required in claim 1. In response, the examiner notes that the rejection was based on the prior art's broad disclosure rather than preferred embodiments. See MPEP 2123. Tomioka et al. ('560) teaches a drawing ratio of less than 20% applicable to a medium carbon steel (col. 3, lines 45-56 and col. 7, lines 62-65) in order to achieve the desired diameter and tensile strength of the wire ('560) (col. 7, lines 62-65). The teachings of Tomioka et al. ('560) apply well to the medium carbon steel of JP ('246).

Third, the applicant argues JP ('246) teaches away from having the intermediate annealing treatment and Tomioka et al. ('560) teaches against having a spherically

annealing step. In response, the examiner notes it is well held that mere disclosure of alternative designs does not teach away. See *In re Fulton*, 391 F. 3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Fourth, the applicant argues that the specific order of the steps in claim 3 is not disclosed by JP ('246) nor Tomioka et al. ('560). In response, see the new ground of rejection of claimed features in the paragraph 3 above.

Fifth, the applicant argues that JP ('246) in view of Tomioka et al. ('560) and further in view of Bach et al. ('166) does not disclose all of the required features on claim 5. In response, see the grounds of the rejections of the limitations of claim 5 in the paragraph 5 above. Bach et al. ('166) does disclose quenching the blank to form a surface layer of martensite would reduce the cooling line length (col. 2, lines 30-32). Using this as a motivation to combine Bach et al. ('166) with JP ('246) in view of Tomioka et al. ('560) is proper and maintained. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to quenching the blank of JP ('246) in view of Tomioka et al. ('560) to form a surface layer of martensite when the microstructure of martensite at the surface is desired.

Sixth, the applicant argues that Sakai et al. ('323) does not teach treating a crankshaft at a temperature ranging from 250 to 350° C for 1 to 2.5 hours as claimed in claims 18 and 19. In response, see the new ground of rejection of claimed features in the paragraphs 7 and 8 above.

Conclusion

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10. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

WZ

4/8/2008

Application Number**Application/Control No.**

10/789,322

Examiner

WEIPING ZHU

**Applicant(s)/Patent under
Reexamination**

ANDO ET AL.

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